Mr. John Mott-Smith
Director of Voting Systems
Office of the Secretary of State
1500 11th Street

6 September 2004

Subject: Certification Report for the Sequoia Voting Systems
WinEDS Ver 3.0.134,
AVC Edge Firmware Rel 4.2A,
with Optech 400-C Firmware Rel 1.02b.

Executive Summary

State certification testing was conducted 24-27 Aug 2004, in Oakland, CA, to certify the Sequoia Voting Systems WinEDS Ver 3.0.134 with AVC Edge Firmware Rel 4.2 and OpTech 400-C (WinETP) Firmware Rel 1.02b. During testing, a request was made to upgrade the AVC Edge to Firmware Rel.4.2a.

Problems were detected in provisional ballot processing under AB 190 and the requirement for separate and aggregate totals reporting for primary parties allowing DTS voting in the primary election.

References:

[Wyle4.2a] Wyle letter #50932B-008*, ITA Qualification Testing of the EDGE Models I & II Direct Record Electronic Voting Machine; Revised Firmware Release 4.2A*., 27 Aug 04
[SVF031005] Steve Freeman, *Certification of the Sequoia Pacific WinEDS 3.0.99 software, AVC Edge Firmware 4.1J, and AVC Edge Hardware Version 4.0.* 5 Oct 03.
[SVF031009] Steve Freeman, *Certification of the Sequoia Pacific AVC Edge Firmware 4.2,* 9 Oct 03.

Introduction

In compliance with California Elections Code 19200 and 19205, Sequoia Voting Systems applied for certification for the following revisions:

1. WinEDS , Version 3.0.134, NASED: (pending), ITA Test Completed::
   With AVC Edge Model I & II, Firmware Rel 4.2a.

The initial request was with the AVC Edge Firmware 4.2 the request was amended to 4.2a to include the change to 4.2a.

WinEDS 3.0.134 includes changes to integrate Optech 400-C, Firmware 1.02b which has been certified earlier operating with EMS/AERO

Significant Change

In the previous certification report [SVF0310], we reported problems with integrating the OpTech 400-C with WinEDS. As part of the certification, a restriction to limit OpTech 400-C to be used with EMS/AERO Version 3.54 and Teamwork was recommended and applied. This version allows WinEDS to be used, no longer requiring the EMS/AERO or Teamwork applications. The change also corrects a less serious problem with reporting voter turnout.

WinEDS 3.0.99 was vulnerable to an error in completing the assignment of text strings or audio files to instructions, titles, contests, candidates, or measures, especially where multiple languages are involved. If the file containing the string or audio message is not linked to the ballot element, a system failure could occur on the DREs. The change provides an automatic edit (called a "completeness check') to prevent programming the DRE until all assignments are made. The check does not ensure that the correct file has been assigned.

Change between AVC Edge 4.2 and 4.2a: If a contest which allows two or more candidates to be cast is large enough that it is "wrapped" across two columns (the first part of the contest is listed at the bottom of one column and continued at the top of the next) in the review page, the system may crash when the contest is voted on. At the time of the testing, the exact conditions which must be present to cause the problem were not verified but the problem itself was demonstrated with the Edge 4.2 version installed.

Outstanding Issues

The WinEDS and AVC Edge security were reviewed in Oct 2003. Updates were made to the State of California Procedures Required for the Use of the AVC Edge Direct Recording Electronic Voting System to include attention to the system security. The new provisions include the need for an anti-virus program to be installed. The anti-virus detection software was not included in the certification test environment. Other suggestions involved identifying for the local IT agent responsible for computer security what Windows 2000/XP security features may be used and which features or services may be removed or disabled without interfering with the WinEDS operations. A similar set of changes are needed for the Optech 400C.

Qualifications

NASED Qualification

1. WinEDS 3.0.99, NASED # N N-1-07-12-11-002 (1990) Dated: 25 Sep 03
   includes:
   a. AVC Edge Firmware Release 4.1J
   b. Optech 400-C, WinETP release 1.02b
   c. Card Activator 4.1/4.32
   d. Card Reader/Writer

   Note: the Optech 400-C use with Win-EDS failed in California State testing as a state unique problem.
2. WinEDS 3.0.99, NASED # N-1-07-12-11-003 (1990), Dated: 9 Oct 03
   Added the AVC Edge Firmware 4.2
3. AVC Edge Firmware 4.2a, letter of completed testing only [Wyle4.2a]
4. WinEDS 3.0.134 , letter of completed testing only [no reference available]

Test Results

The test election was based on the San Diego 2002 Primary and General with the addition of Presidential race (with semi-fictional candidates to complete the General election) in seven political parties. Three parties, American Independent, Democratic, and Republican, were defined as allowing DTS voter participation and reporting with the Republican DTS not permitting participation in Presidential nominations (See details in Attachment B).

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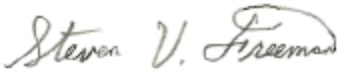
During testing of the provisional voting using the AVC Edge DRE, the provisional ballot for a split precinct could not be assigned to the split. A write-in candidate on a split ballot was not recognized. Although provisional ballots on this system are to be submitted as paper ballots on the upcoming election, this problem fails to satisfy the criteria of AB 190 for further elections.

WinEDS does not support the reporting of aggregate and separate totals for primary parties who allow Decline-To-State voters to participate. Sequoia presented an unqualified utility called ReportViewer to process the results from WinEDS and produce the desired report. They were unable to get it to work during the certification test.

Conclusion

Review and testing of this proposed configuration showed compliance with the California Election Code with the exception of proper processing of provisional ballots under AB 190 and proper reporting of the separate and aggregate totals for parties allowing DTS voting in the primary election.

Sincerely,



Steven V. Freeman

Two Attachments:

A. Hardware Description with a list of the test configuration components.
B. Test Election Design

Attachment A.

Hardware Descriptions

WinEDS

WinEDS can be installed on one to three PC-compatible basic units, the WinEDS database server managing a MS SQL 2000 database, a WinEDS workstation (may be networked for multiple workstations), and a WinEDS Report server. For more details on that setup, refer to the SVF031005, AppA and B. For this test, all three components were installed and operated on a single workstation unit as described below.

AVC Edge

The AVC Edge comes in two models: the Model I (formerly identified as Hardware Version 3.1, M/N 096000011) and Model II (formerly identified as Hardware Version 4.0, M/N 096000021). The AVC Edge is a touch screen Direct-Record Electronic (DRE) voting machine. See SVF031009 for details. For this test, the units listed below were used.

OpTech 400-C (identified in some older documents as IV-C)

The OpTech 400-C is a high-speed optical scanner used for central count operations. With the WinEDS, it typically is used of absentee ballot counting but may also be used to count paper ballots collected from early voting stations or submitted as provisional ballots. The version used in this certification has been certified for use earlier in California with older election management software identified as EMS/AERO and Teamwork. Election definitions and voting results are transferred via a 3.5 DOS formatted diskette.

Test Configuration

WinEDS 3.0

WinEDS Election Management Software
Version 3.0.134

Server/Workstation Configuration:
Dell OptiPlex SX260, S/N 8K2P831
2.40 GHz Intel Pentium 4 processor
256 MByte RAM
40 GB Hard Drive
CDRW/DVD Drive
HP Color LaserJet 8550 (on corporate lan)

MS Windows XP Professional, SPK1 (with SPK2 partial patches)
MS SQL Server 8.000.760
Microsoft Office XP 10.0.2627
Microsoft Visio Professional 2002 –SR1
Adobe Distiller/Acrobat 6.0.0
Intellidiv ImageScaler 6.41
Powerbuilder (Common Files Dir)
WinZip 8.1 (for installation of software packages)
AnTec USB drivers for PCMCIA Memory cartridges
--used for supporting AVC Edge/Carc activators
NCT Audio to support audio files.

Card Activator

Firmware Version 4.3.2 SN: 338

Sequoia AVC Edge (3 machines)

Firmware Version 4.2 SN: 10336, 20700, 19538, 20701

Sequoia AVC Edge II (2 machines)

Firmware Version 4.2 SN: 22138 (configured as Early Voting), 22148 (tested 4.2a change)

Sequoia 400C

Hardware Version 2.02: S/N: 200209
Dell Optiplex G1
450MHz Pentium II
64 Megabytes Installed Memory
3.24 Gigabytes Usable Hard Drive Capacity
CD Rom (non-writeable) Drive
3.5 diskette
No printer (although one may be attached)
USB Hub
3Com Integrated Fast Ethernet
NT Apm/Legacy Interface
PS\mouse

Dual Boot:
1. MS Windows 98SE (used for WinETP operation)
2. Windows 2000 Professional Build 2195
   No security patches or fixes

Sequoia Software
400-C Diagnostics
Ballot Sorter Ver. 1.0.0.0

Security Parameters and Procedures

Local jurisdictions are expected to provide the physical security necessary for the voting system equipment including the

- servers, workstations, or laptops providing central and polling place election management support
- the voting machines, and
- media or ballots containing the ballots/voting records

Each jurisdiction is required to prepare a local security plan is required to be provided to the California Secretary of State; These plans will need input and advice from the vendor. The following information noted in certification testing may need to be considered in either the California Procedures required from the vendor or as further input in planning and preparing local Security Plans.

WinEDS security is based on specifically allowing authorized users the authority to perform their assigned tasks without giving access to unauthorized users or tasks. The security program is based on the user account management provided by MS SQL Server. The design optionally supports adding additional workstations with restricted users and roles allowed for the workstation. For example, a work station may be created for producing final reports where users may request a report but can not import or delete data. The role assignments support a strong model for the separation of function (a audit/security principle).

The initial default password is a product of the setup of the MS SQL Server database. The primary administrator for the Server database has initial access rights using his or her SQL Server password. Once the SQL administrator has opened WinEDS, they can create other users with roles providing administrative or fewer rights.

All users are allowed to reset and change their own password. Passwords may be from 1 to 30 characters, preferably mixed characters and numbers. Some special characters (including blanks) may be used but extended characters are discouraged as they can cause problems. The local administrator can also set (optional) the duration of the password, the number of concurrent sessions that can be open with that username, the number of retries of a password before the password is locked out.

[redacted]

Along with this procedure for the administrator, we are also asking Sequoia to investigate and provide information/recommendations on what services and security profile features in Windows XP can be safely disabled for use of WinEDS in accordance with Microsoft guidance of secure operations. At the current time, the local election administrator or ITA administrator are responsible for establishing security profiles of election servers and workstations. Although the choice is theirs, the vendor needs to let them know what will work and allow safe operations of the WinEDS.

Security for the AVC Edge and OpTech 400-C are unchanged from previous reports. [redacted]

[redacted]

Additional procedures which may need to be considered are:

a. The use of tamper-proof seals to supplement physical security as a detection of tampering.
b. Methods of securing unused communication and device ports and connections when stored or otherwise not under observation or secure storage.
c. Installing, maintaining, and using anti-virus software and intrustion detection software.
d. Blocking the installation of additional software except as required to support the election operation.
e. Removing or disabling operating system features or services which are not needed, especially telecommunication features such as telenet and remote processing.
f. Verification of results on output media before releasing and after delivery by comparison of detailed reports, file characteristics, digital hash records, or electronic signatures. Encryption may not be necessary or sufficient to satisfy this objective.

Attachment B.

Test Election Design

	Precinct	1	2	2	3	4	5	6	7	8	9	10
Type	Split		1	2								
SW	Federal, STATE	x	x	x	x	x	x	x	x	x	x	x
SD	Board of Equal 3	x	x	x	x	x	x	x	x	x	x	x
SD	CONGRESS 49	x	x	x								
SD	CONGRESS 50				x	x						
SD	CONGRESS 51						x	x				
SD	CONGRESS 52								x	x		
SD	CONGRESS 53										x	x
SD	STATE SENATE 36	x	x									
SD	STATE SENATE 37				x		x					
SD	STATE SENATE 38			x		x						
SD	STATE SENATE 39								x		x	
SD	STATE SENATE 40							x		x		x
SD	ASSEMBLY 66	x							x			
SD	ASSEMBLY 74				x					x		
SD	ASSEMBLY 75		x	x							x	
SD	ASSEMBLY 76						x	x				
SD	ASSEMBLY 77					x						x
U	COUNTY, Unincorporated		x					x				
C	CHULA VISTA			x								
C	LEMON GROVE	x										
R	PORTER VISTA					x						
S	Measure	x	x	x	x	x	x	x	x	x	x	x

C city, M Military, R unincorporated remainder of county, U Unincorporated place in a county.

Further details on test election makeup and

The test election was modified from the San Diego by combining various districts and races into a selection of ten precincts which concisely included samples of state, statewide district (State Senate and Assembly Districts), judicial, (See Test Design Matrix above

Testing was completed using a pre-marked Logic and Accuracy deck. The test deck was used to verify basic election definition and verify the rotation was set up correctly on the Optech 400C ballots. The same election with rotation was used for the AVC Edges where a lesser number of manual ballots were voted and recorded.

Additional ballots were marked to test response to common voter errors and some ballot tampering changes. No significant problems were encountered.

A total of 800 primary ballots were cast. exercising the following ballot logic and conditions:

Primary party ballots with DTS voting and reporting
Non-Partisan races
Split precinct
Vote for 2 of 5,
Write-in votes (including potential over-vote conditions)
Blank ballots
Rotation based on assembly district at state, state districts, and local levels
(Multiple languages. Printed ballots were provided in English, Spanish, and Vietnamese)
Long names in candidate fields.
Turn-out statistics on final summary reports
Measures
Polls open, close, and report printing.
Review of audit logs.
Consolidating absentee and Election Day precinct voting.

Four audio ballots were also casted to confirm the ballot navigation and all contests/candidates were included for four ballot styles, the Dem Declared voters, Dem DTS, Rep Declared, and Rep DTS voters. The testing included English and Spanish. The setup included trying to include contest/candidates with no assigned language string but WinEDS completeness edits identified the entries with bad links. This feature does not guarantee the audio files are correct but does confirm they are defined.

After elections were run and results downloaded, went back to one of the AVC Edges and recovered the election files retained in internal memory. Verified the results off the original cartridge and the audit cartridge were the same.